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Hellpach, in that Peters recognizes the significance of luminosity of stimulus. It is to be hoped that he will repeat his determinations, employing a method which provides for uniformity of adaptation and for equality of color-value of stimuli. Moreover, it is to be mentioned that no investigation of this topic is complete which refuses to take into account the fact that certain colors do not change in tone in passing across the retina.

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A Factor in Mental Development. MARGARET FLOY WASHBURN. *Philosophical Review,* November, 1904.

"When we trace the development of mental life upward from the lowest forms of the animal kingdom, we are led to believe that the process has been marked chiefly by progress in two respects: first, advance in the power to discriminte among stimuli, and second, the rise, somewhere in the course of development, of the power to form 'free ideas' . . . It is the aim of the present paper to indicate how both these great gains of psychic evolution have been dependent in part at least upon one factor: the organism's growing power to react to stimuli not in immediate contact with the body."

In support of the first part of her thesis the author points to the fact that "stimuli such as light or sound, which can not directly and instantaneously affect the organism's life, are those which have given rise to the greatest number of qualitatively distinguishable sensations. The reason is that, since it is unnecessary for the organism to make . . . instant response to such stimuli, it is at liberty to spend its psychic energies on qualitative analysis. Time can be taken to find out what the stimuli are, because it is not so desperately necessary to discover where they are and act accordingly. . . . On the other hand, the two classes of sensations that illustrate clearly how qualitative discrimination may be swamped through the immediate need for local discrimination are touch sensations and, preëminently, sensations of pain. Here the stimulus . . . is where it may injure, or actually is injuring. Immediate motor response . . . is demanded; there is no time for qualitative investigation. To say that the contact senses have fewer qualities than sight and hearing because the variety of stimuli for sight and hearing is greater, is obviously to beg the question completely. There is as much variety in the chemical constitution of bodies as there is in the ether or air disturbances which they send to us."

In support of the second part of her thesis Professor Washburn urges that stimuli, which by reason of their immediate bearing upon the welfare of the organism are at once transformed into motor reactions, do not have time to make a very deep impress upon the brain. "But when the creature has developed a capacity to be affected by light and sound . . . then the current of energy sent by the stimulus into the nervous substance is not at once drained off, but may linger sufficiently long to produce whatever alteration, whatever impress upon sensory centers, is needful to insure their subsequent functioning as the basis of a free image. Delayed reaction . . . is then the source of the image-forming power."

The general conception of the ultimate cognitive value of ideas as varying inversely with their immediate motor utility is of course by no means new, but the peculiar merit of this admirable paper seems to the present writer to lie in the fact that its author recognizes not merely the truth of the conception but also its vital importance for the understanding of mental evolution. The primary desideratum of any evolutionary theory is a principle which will allow for a perfectly continuous development of a series of fundamentally different species. Professor Washburn's theory meets this demand. For if we assume that every stimulus expends its energy partly in a motor discharge and partly in modifying a sensory center, we can at once recognize the possibility of two fundamentally different types of organism, in one of which the motor predominates over the sensory result of the stimulus, while in the other the sensory predominates over the motor. As the organism became more and more perfectly adjusted to its environment, its stimuli would be less needed for motor reactions, and would thus become more and more free to expend themselves in modifying the sensory centers, until a *critical point* would be reached in which the energy of the stimulus devoted to sensory modification would just equal the energy devoted to motor discharge. Organisms below this critical point would only possess 'intelligence' or the capacity to profit by *past* experience, but organisms which had passed beyond the critical point would possess 'reason' or the power to form free ideas depictive of the *future*. The difference of the two types of organism would be momentous and yet the evolution of one from the other would be continuous, for it would not directly involve any new factor, but only a change of emphasis in factors already present.

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The Soul—A Study of Past and Present Beliefs. L. D. ARNETT. *The American Journal of Psychology,* 1904, XV., pp. 121–200; 347–382.

This investigation was undertaken by the author, he says, to supply a lack of knowledge on his own part, and for the benefit of others similarly situated. In working toward this result it aims so to present the views of psychologists and of theologians that 'some definite understanding of the use of the term may at least be suggested.'

Primitive ideas of the soul are first considered. The study begins with an effort to get at the conditions that have given rise to this idea and the explanations offered to account for it. The word 'soul' as used by various peoples is dwelt upon. The soul has usually been associated with some animate form,—with the bird, butterfly, mouse, serpent, lizard, fish and other animals. Again it is identified with shadows, with portraits, and with one's image reflected in water or in a mirror. It is most frequently regarded as shadow, breath and wind, then as life, heart, echo, etc. Rarely is the soul believed to be a material object. Sometimes the individual is thought to have a plurality of souls. The